

RIDERSHIP ESTIMATING METHODOLOGY

This appendix describes the methodology and assumptions behind the calculation of ridership over the 4-hour commute period, the average weekday, and the year from 2003 to 2030.

PROJECTING RIDERSHIP UNDER CURRENTLY-PLANNED SERVICE

Deriving 4-Hour Figures by Year

Ridership calculations begin with outputs from the two computer models described in the Strategic Service and Investment Plan. These outputs consist of westbound and eastbound ridership figures by route for vehicles, walk-on passengers, and in-vehicle passengers, for the years 2003, 2020, and 2030. For intervening years, route-specific constant rates of annual growth are assumed.

Initial 2003 Expansion Factors

Expansion factors are calculated to allow for scaling 4-hour figures up to daily and annual figures. Daily expansion factors are derived by dividing daily ridership model outputs (in both directions) for 2003 by 4-hour ridership model outputs (in both directions) for 2003. Annual expansion factors are derived by dividing annual ridership figures in Fiscal Year 2003 (taken from Rider Segment Reports) by daily ridership model outputs (in both directions) for 2003. Exhibits 1-3 below shows 2003 expansion factors.

Exhibit 1: Daily and Annual Fiscal Year Expansion Factors by Route-Mode, 2003 Westbound

Route	4-Hour to Daily Expansion Factors			Daily to Annual Expansion Factors		
	Vehicles	Walk-Ons	In-Vehicle Passengers	Vehicles	Walk-Ons	In-Vehicle Passengers
Pt. Defiance-Tahlequah	2.45	2.12	2.89	340	386	541
Southworth-Vashon	3.34	7.42	9.25	293	293	456
Fauntleroy-Vashon	2.44	1.38	2.25	341	339	509
Fauntleroy-Southworth	2.31	1.50	1.82	337	294	448
Seattle-Southworth	N/A	N/A	N/A	N/A	N/A	N/A
Seattle-Southworth (via Seattle-Vashon PO)	N/A	1.00	N/A	N/A	265	N/A
Seattle-Vashon Passenger-Only	N/A	1.14	N/A	N/A	265	N/A
Seattle-Bremerton	2.76	1.69	2.23	342	566	479
Seattle-Bainbridge Island	2.37	1.39	2.02	388	333	427
Edmonds-Kingston	2.84	1.81	3.35	345	303	539
Mukilteo-Clinton	2.45	1.41	2.74	360	334	535
Pt. Townsend-Keystone	3.65	2.88	2.70	435	712	578
Domestic (Anacortes-San Juans)	N/A	N/A	N/A	404	1,247	647
San Juan Inter-Island	N/A	N/A	N/A	350	482	684
Sidney, B.C. International Route Legs	N/A	N/A	N/A	433	987	371



WASHINGTON STATE FERRIES

Exhibit 2: Daily and Annual Fiscal Year Expansion Factors by Route-Mode, 2003 Eastbound

Route	4-Hour to Daily Expansion Factors			Daily to Annual Expansion Factors		
	Vehicles	Walk-Ons	In-Vehicle Passengers	Vehicles	Walk-Ons	In-Vehicle Passengers
Pt. Defiance-Tahlequah	4.42	3.51	5.69	340	386	541
Southworth-Vashon	2.78	3.56	1.48	293	293	456
Fauntleroy-Vashon	5.16	1.79	3.10	341	339	509
Fauntleroy-Southworth	4.20	8.11	3.80	337	294	448
Seattle-Southworth	N/A	N/A	N/A	N/A	N/A	N/A
Seattle-Southworth (via Seattle-Vashon PO)	N/A	47.50	N/A	N/A	265	N/A
Seattle-Vashon Passenger-Only	N/A	7.06	N/A	N/A	265	N/A
Seattle-Bremerton	4.37	9.58	4.85	342	566	479
Seattle-Bainbridge Island	4.00	9.53	6.44	388	333	427
Edmonds-Kingston	4.07	6.36	5.04	345	303	539
Mukilteo-Clinton	4.44	11.86	4.65	360	334	535
Pt. Townsend-Keystone	4.19	5.14	3.72	435	712	578
Domestic (Anacortes-San Juans)	N/A	N/A	N/A	404	1,247	647
San Juan Inter-Island	N/A	N/A	N/A	350	482	684
Sidney, B.C. International Route Legs	N/A	N/A	N/A	433	987	371

Exhibit 3: Daily and Annual Fiscal Year Expansion Factors by Route-Mode, 2003 Both Directions

Route	4-Hour to Daily Expansion Factors			Daily to Annual Expansion Factors		
	Vehicles	Walk-Ons	In-Vehicle Passengers	Vehicles	Walk-Ons	In-Vehicle Passengers
Pt. Defiance-Tahlequah	3.15	2.65	3.83	340	386	541
Southworth-Vashon	3.03	4.81	2.55	293	293	456
Fauntleroy-Vashon	3.32	1.56	2.60	341	339	509
Fauntleroy-Southworth	2.98	2.54	2.46	337	294	448
Seattle-Southworth	N/A	N/A	N/A	N/A	N/A	N/A
Seattle-Southworth (via Seattle-Vashon PO)	N/A	1.96	N/A	N/A	265	N/A
Seattle-Vashon Passenger-Only	N/A	1.96	N/A	N/A	265	N/A
Seattle-Bremerton	3.38	2.87	3.06	342	566	479
Seattle-Bainbridge Island	2.98	2.43	3.07	388	333	427
Edmonds-Kingston	3.35	2.82	4.03	345	303	539
Mukilteo-Clinton	3.15	2.52	3.45	360	334	535
Pt. Townsend-Keystone	3.90	3.69	3.13	435	712	578
Domestic (Anacortes-San Juans)	N/A	N/A	N/A	404	1,247	647
San Juan Inter-Island	N/A	N/A	N/A	350	482	684
Sidney, B.C. International Route Legs	N/A	N/A	N/A	433	987	371

The following are some noteworthy observations related to Exhibits 1-3:

- San Juan Islands routes do not have 4-hour figures, so those routes do not have 4-hour to daily expansion factors.
- The Seattle-Vashon PO route (and the Seattle-Southworth portion of it) do not have expansion factors for vehicles or in-vehicle passengers because they are passenger-only routes.
- The Seattle-Southworth route does not have expansion factors because it does not exist in 2003.
- Discrepancies between westbound and eastbound 4-hour to daily expansion factors occur because the 4-hour period in question is during the afternoon commute period (3pm-7pm).

2 DRAFT LONG-RANGE STRATEGIC PLAN: TECHNICAL APPENDICES

APPENDIX C: RIDERSHIP METHODOLOGY

Therefore, for most routes, westbound ridership in the afternoon will correspond to a large proportion of daily westbound trips, but eastbound ridership in the afternoon will correspond to a small fraction of total eastbound trips during the weekday, with most coming during the morning peak period. These discrepancies are largest on routes that see the greatest proportion of commuter traffic, like the Seattle-Vashon PO, Mukilteo-Clinton, Seattle-Bainbridge, and Seattle-Bremerton routes, and in modes that see the greatest proportion of commuter traffic, like walk-ons and (to a lesser extent) in-vehicle passengers.

- For example, the Seattle-Southworth portion of the Seattle-Vashon PO route has a daily westbound expansion factor of 1.00, indicating that the westbound trips that take place in the PM peak are the only westbound trips that take place during the day. The eastbound expansion factor, however, is 47.50, indicating that the few eastbound riders during the PM peak will lead to a much greater number of eastbound riders during the rest of the day (mostly in the morning).

Eliminating “Ghost Riders”

Since ridership growth is the primary driver of operating revenues, it is important to ensure that overall ridership growth is not overstated. Therefore, a conservative approach was adopted when projecting certain commute-period trends into non-commute periods, and endeavors were made to eliminate non-commute-period “ghost riders.” Specifically, there are two commute-period trends that were identified as being primarily related to capacity constraints from commute-period congestion:

- The increase in the average vehicle occupancy.
- The increase in the proportion of riders using the walk-on mode.

Out of total daily ridership, some riders use WSF during commute periods, and others do not. In order to derive daily commute-period daily ridership figures, 4-hour ridership is multiplied by two for each route-mode-year, assuming that a westbound commuter in the morning will be an eastbound commuter in the afternoon, and vice versa. For vehicles and walk-ons, WSF commute-period daily riders in 2003 are subtracted from total daily riders in 2003 to arrive at non-commute-period daily riders (riders during early morning, mid-day, and late night) in 2003.

In-vehicle passengers are calculated by multiplying that given year’s non-commute-period vehicles by the average vehicle occupancy seen in 2003, effectively holding the non-commute-period average vehicle occupancy steady at 2003 levels.

For walk-on passengers in years after 2003, non-commute-period ridership is calculated by scaling 2003 ridership up by the level of growth seen in non-commute-period vehicles and in-vehicle passengers for that given year. Effectively, then, non-commute-period riders increase at the same rate as commute-period vehicles.

Similar calculations are performed for annual ridership figures, multiplying daily commute-period riders by five (the number of peak days in a week) and by 52 (the number of weeks in a year) to arrive at annual commute-period riders. From those figures, annual non-commute-period riders are determined, and then the same methodology described above is applied to in-vehicle passengers and walk-on passengers.



WASHINGTON STATE FERRIES

2030 Expansion Factors

By eliminating ghost riders through the method described above, the walk-on and in-vehicle passenger expansion factors are effectively modified (and usually lowered). Exhibits 4-9 later in this Appendix show the results of these changes under Draft Plan service assumptions.

Reconciling Two Ridership Models

Two different methods are used to predict ridership. The first method combines two models (the PSRC regional model and WSF's own ridership model) and has outputs for the years 2020 and 2030. This method results in 4-hour outputs and leads to annual ridership figures through the methodology described above. The second model is an econometric model that predicts ridership in the short-term.

Because the two methods do not predict the same ridership levels, ridership projections are developed that are a hybrid of the two, favoring the econometric model in the short term and the regional model in the long term.

There is confidence in the econometric model's ability to predict ridership through 2008. Therefore, the growth projected by the regional model is suppressed by multiplying ridership growth in the 4-hour period by factors that align annual projections with the econometric model. These factors vary by mode, as ridership is reconciled with both vehicle and passenger projections from the econometric model, but they are applied consistently across all routes.

Between 2008 and 2020, a smooth curve is developed to grow each route-mode's ridership from the econometric model to the regional and ridership models.

Calculating Ridership

There are three main phases of ridership calculations:

- **2003-2008.** 4-hour outputs are suppressed such that annual ridership figures will match up with the econometric model. Daily and annual riders are calculated by multiplying suppressed 4-hour figures by 2003 expansion factors and then eliminating ghost-riders.
- **2009-2020.** 4-hour outputs are increased to smoothly bridge the gap between the econometric model and the regional and WSF models. Daily and annual riders are calculated by multiplying 4-hour figures by 2003 expansion factors and then eliminating ghost-riders.
- **2021-2030.** 4-hour outputs are assumed to grow steadily from 2020 model outputs to 2030 model outputs. Daily and annual riders are calculated by multiplying 4-hour figures by 2003 expansion factors and then eliminating ghost-riders.

PROJECTING RIDERSHIP UNDER THE DRAFT SERVICE PLAN

Development of Two 4-Hour Ridership Curves

In order to determine 4-Hour Draft Plan ridership, two ridership curves for each route-mode are developed. The first is the currently-planned service curve, described above. The second is a curve developed in precisely the same manner as that curve, but using model outputs for 2020 and 2030 that incorporate WSF's proposed service plan.

Reconciling the Two Curves

As service is added to each route, that route's ridership curve will move away from the currently-planned service curve and towards the draft plan curve. These two curves are reconciled by measuring the difference between a route's service hours under the draft service plan and currently planned service, as well as the same difference for the travel shed as a whole. Those differences in service hours in a given year are compared to overall service hour differences in the model's benchmark years (2020 and 2030), and weights are given to each of the two curves depending on the percentage of total service hours that have already been added in a given year.

Induced Growth in Non-PSRC Routes

Because the PSRC's regional model only covers routes in the Puget Sound region, some routes are not included (Mukilteo-Clinton, Pt. Townsend-Keystone, and the San Juan Islands). Historically, when service is added to a route, that route receives an upsurge in ridership as travelers respond to increased service levels. When service is added to the Whidbey and San Juan Islands routes, then, it is expected that ridership will increase. Therefore, historical data on ridership responses to increased service is used in order to determine how much demand will be induced by additional service. This induced demand leads to ridership increases of approximately 10% on Whidbey and San Juan Islands routes.

Expanding to Daily and Annual Figures

Ridership in the 4-hour commute period is projected using the methods described above (development of two curves, reconciliation of the curves, and addition of induced ridership). Once 4-hour ridership has been projected, it is expanded to daily and annual ridership using the same methodology described above for currently-planned service. Expansion factors in 2030 under Draft Plan service assumptions are compared to 2003 expansion factors in Exhibits 4-9 below.



WASHINGTON STATE FERRIES

**Exhibit 4: 4-hour to Daily Expansion Factors by Route-Mode,
2003 and 2030 Westbound Draft Plan**

Route	Vehicles		Walk-Ons		In-Vehicle Passengers	
	2003	2030	2003	2030	2003	2030
Pt. Defiance-Tahlequah	2.45	2.45	2.12	1.82	2.89	2.28
Southworth-Vashon	3.34	3.34	7.42	4.61	9.25	1.65
Fauntleroy-Vashon	2.44	2.55	1.38	1.37	2.25	2.25
Fauntleroy-Southworth	2.31	N/A	1.50	N/A	1.82	N/A
Seattle-Southworth	N/A	2.37	N/A	1.14	N/A	2.09
Seattle-Southworth (via Seattle-Vashon PO)	N/A	N/A	1.00	N/A	N/A	N/A
Seattle-Vashon Passenger-Only	N/A	N/A	1.14	N/A	N/A	N/A
Seattle-Bremerton	2.76	1.84	1.69	1.51	2.23	1.64
Seattle-Bainbridge Island	2.37	2.33	1.39	1.30	2.02	2.09
Edmonds-Kingston	2.84	2.78	1.81	1.34	3.35	2.21
Mukilteo-Clinton	2.45	2.60	1.41	1.21	2.74	2.48
Pt. Townsend-Keystone	3.65	3.51	2.88	2.33	2.70	2.62
Domestic (Anacortes-San Juans)	N/A	N/A	N/A	N/A	N/A	N/A
San Juan Inter-Island	N/A	N/A	N/A	N/A	N/A	N/A
Sidney, B.C. International Route Legs	N/A	N/A	N/A	N/A	N/A	N/A

**Exhibit 5: 4-hour to Daily Expansion Factors by Route-Mode,
2003 and 2030 Eastbound Draft Plan**

Route	Vehicles		Walk-Ons		In-Vehicle Passengers	
	2003	2030	2003	2030	2003	2030
Pt. Defiance-Tahlequah	4.42	4.43	3.51	3.20	5.69	11.20
Southworth-Vashon	2.78	2.78	3.56	3.07	2.55	3.79
Fauntleroy-Vashon	5.16	4.73	1.79	3.72	2.60	2.92
Fauntleroy-Southworth	4.20	N/A	8.11	N/A	2.46	N/A
Seattle-Southworth	N/A	4.82	N/A	23.21	N/A	5.84
Seattle-Southworth (via Seattle-Vashon PO)	N/A	N/A	47.50	N/A	N/A	N/A
Seattle-Vashon Passenger-Only	N/A	N/A	7.06	N/A	N/A	N/A
Seattle-Bremerton	4.37	7.85	9.58	27.69	3.06	8.96
Seattle-Bainbridge Island	4.00	4.95	9.53	9.93	3.07	7.29
Edmonds-Kingston	4.07	3.69	6.36	6.17	4.03	5.64
Mukilteo-Clinton	4.44	3.99	11.86	13.92	3.45	3.91
Pt. Townsend-Keystone	4.19	4.38	5.14	3.40	3.13	3.70
Domestic (Anacortes-San Juans)	N/A	N/A	N/A	N/A	N/A	N/A
San Juan Inter-Island	N/A	N/A	N/A	N/A	N/A	N/A
Sidney, B.C. International Route Legs	N/A	N/A	N/A	N/A	N/A	N/A

APPENDIX C: RIDERSHIP METHODOLOGY

Exhibit 6: 4-hour to Daily Expansion Factors by Route-Mode, 2003 and 2030 Both Directions Draft Plan

Route	Vehicles		Walk-Ons		In-Vehicle Passengers	
	2003	2030	2003	2030	2003	2030
Pt. Defiance-Tahlequah	3.15	3.15	2.65	2.32	3.83	3.79
Southworth-Vashon	3.03	3.03	4.81	3.69	2.55	2.29
Fauntleroy-Vashon	3.32	3.32	1.56	2.00	2.60	2.54
Fauntleroy-Southworth	2.98	N/A	2.54	N/A	2.46	N/A
Seattle-Southworth	N/A	3.18	N/A	2.17	N/A	3.08
Seattle-Southworth (via Seattle-Vashon PO)	N/A	N/A	1.96	N/A	N/A	N/A
Seattle-Vashon Passenger-Only	N/A	N/A	1.96	N/A	N/A	N/A
Seattle-Bremerton	3.38	3.18	2.87	2.87	3.06	2.98
Seattle-Bainbridge Island	2.98	3.18	2.43	2.30	3.07	3.28
Edmonds-Kingston	3.35	3.18	2.82	2.20	4.03	3.20
Mukilteo-Clinton	3.15	3.15	2.52	2.23	3.45	3.04
Pt. Townsend-Keystone	3.90	3.90	3.69	2.77	3.13	3.07
Domestic (Anacortes-San Juans)	N/A	N/A	N/A	N/A	N/A	N/A
San Juan Inter-Island	N/A	N/A	N/A	N/A	N/A	N/A
Sidney, B.C. International Route Legs	N/A	N/A	N/A	N/A	N/A	N/A

The following are notable observations related to Exhibits 4-6:

- Routes that do not have 4-hour to Daily factors:
 - San Juan Islands routes do not have 4-hour figures, so those routes do not have 4-hour to daily expansion factors.
 - The Seattle-Vashon PO route (and the Seattle-Southworth portion of it) do not have expansion factors for vehicles or in-vehicle passengers because they are passenger-only routes.
 - Seattle-Southworth does not have expansion factors in 2003 because it does not exist, in Fauntleroy-Southworth does not have expansion factors in 2030 because it will not exist under the Draft Plan.
- Vehicles expansion factors
 - All routes will see some variations between westbound and eastbound expansion factors. These variations occur when there are differences in projected growth rates for westbound and eastbound 4-hour PM peak ridership. Those differential growth rates are assumed to be mirrored during the AM peak period; if eastbound ridership grows faster than westbound ridership in the PM peak, it is assumed that westbound ridership grows faster than eastbound ridership in the AM peak. Therefore, the proportion of riders traveling in the peak direction during the peak period might change, but the overall relationship between peak-period ridership in both directions and daily ridership in both directions will not change.
 - The following routes maintain constant expansion factors for ridership in both directions, but see small variations in westbound and eastbound expansion factors due to the differential projected growth rates in westbound and eastbound 4-hour peak ridership explained above: Pt. Defiance-Tahlequah, Southworth-Vashon, and Fauntleroy-Vashon.
 - The following routes maintain constant expansion factors for ridership in both directions, but see variations in westbound and eastbound expansion factors due to 1) differential projected



WASHINGTON STATE FERRIES

growth rates in westbound and eastbound 4-hour peak ridership; and 2) adjustments reflecting data that shows an imbalance in daily westbound and eastbound ridership (due to the fact that WSF only charges passengers in one direction on these routes): Mukilteo-Clinton and Port-Townsend Keystone.

- The following routes have their expansion factors in both directions equalized at an average figure across the Kitsap travel shed: Seattle-Bremerton, Seattle-Bainbridge, Edmonds-Kingston, and Seattle-Southworth. This equalization helps to better model the shifts in ridership that occur as service is added to or subtracted from routes in the shed. Along with this equalization, the westbound and eastbound factors also vary due to the two reasons explained in the previous bullet.
- Walk-Ons
 - By eliminating ghost riders through the method described above (tying off-peak walk-on growth to vehicle growth), walk-on expansion factors in both directions are usually lowered. In some cases, however, commute-period vehicles are expected to grow at a faster rate than commute-period walk-ons. In these cases, off-peak walk-on growth is still tied to peak vehicle growth, so walk-on expansion factors either stay the same or increase.
 - Because off-peak walk-on growth is tied to peak vehicle growth, the discrepancies between westbound and eastbound expansion factors for vehicles noted above will also apply to expansion factors for walk-ons.
 - On Fauntleroy-Vashon, the walk-on expansion factor in both directions increases from 1.56 to 2.00. This increase occurs because, in later years, it is assumed that every commute-period trip in one direction will have a corresponding commute-period trip in the other direction, leading to a daily expansion factor of 2.00.
- In-Vehicle Passengers
 - By eliminating ghost riders through the method described above (tying off-peak in-vehicle passenger growth to vehicle growth by holding average vehicle occupancy steady), in-vehicle passenger expansion factors in both directions are usually lowered. In some cases, however, commute-period vehicles are expected to grow at a faster rate than commute-period in-vehicle passengers (causing average vehicle occupancy to decrease). In these cases, off-peak in-vehicle passenger growth is still tied to 2003 average vehicle occupancy, so in-vehicle passenger expansion factors either stay the same or increase.
 - Because off-peak in-vehicle passenger growth is tied to average vehicle occupancy, the discrepancies between westbound and eastbound expansion factors for vehicles noted above will also apply to expansion factors for in-vehicle passengers.

APPENDIX C: RIDERSHIP METHODOLOGY

**Exhibit 7: Daily to Annual (Fiscal Year) Expansion Factors by Route-Mode,
2003 and 2030 Westbound Draft Plan**

Route	Vehicles		Walk-Ons		In-Vehicle Passengers	
	2003	2030	2003	2030	2003	2030
Pt. Defiance-Tahlequah	340	340	386	332	541	538
Southworth-Vashon	293	293	293	286	456	376
Fauntleroy-Vashon	341	341	339	263	509	490
Fauntleroy-Southworth	337	N/A	294	N/A	448	N/A
Seattle-Southworth	N/A	363	N/A	273	N/A	445
Seattle-Southworth (via Seattle-Vashon PO)	N/A	N/A	265	N/A	N/A	N/A
Seattle-Vashon Passenger-Only	N/A	N/A	265	N/A	N/A	N/A
Seattle-Bremerton	342	363	566	354	479	433
Seattle-Bainbridge Island	388	363	333	290	427	465
Edmonds-Kingston	345	363	303	288	539	458
Mukilteo-Clinton	360	360	334	297	535	484
Pt. Townsend-Keystone	435	435	712	533	578	569
Domestic (Anacortes-San Juans)	404	404	1,247	1,247	647	415
San Juan Inter-Island	350	350	482	482	684	508
Sidney, B.C. International Route Legs	433	433	987	987	371	274

**Exhibit 8: Daily to Annual (Fiscal Year) Expansion Factors by Route-Mode,
2003 and 2030 Eastbound Draft Plan**

Route	Vehicles		Walk-Ons		In-Vehicle Passengers	
	2003	2030	2003	2030	2003	2030
Pt. Defiance-Tahlequah	340	340	386	332	541	538
Southworth-Vashon	293	293	293	286	456	376
Fauntleroy-Vashon	341	341	339	263	509	490
Fauntleroy-Southworth	337	N/A	294	N/A	448	N/A
Seattle-Southworth	N/A	363	N/A	273	N/A	445
Seattle-Southworth (via Seattle-Vashon PO)	N/A	N/A	265	N/A	N/A	N/A
Seattle-Vashon Passenger-Only	N/A	N/A	265	N/A	N/A	N/A
Seattle-Bremerton	342	363	566	354	479	433
Seattle-Bainbridge Island	388	363	333	290	427	465
Edmonds-Kingston	345	363	303	288	539	458
Mukilteo-Clinton	360	360	334	297	535	484
Pt. Townsend-Keystone	435	435	712	533	578	569
Domestic (Anacortes-San Juans)	404	404	1,247	1,247	647	415
San Juan Inter-Island	350	350	482	482	684	508
Sidney, B.C. International Route Legs	433	433	987	987	371	274



WASHINGTON STATE FERRIES

Exhibit 9: Daily to Annual (Fiscal Year) Expansion Factors by Route-Mode, 2003 and 2030 Both Directions Draft Plan

Route	Vehicles		Walk-Ons		In-Vehicle Passengers	
	2003	2030	2003	2030	2003	2030
Pt. Defiance-Tahlequah	340	340	386	332	541	538
Southworth-Vashon	293	293	293	286	456	376
Fauntleroy-Vashon	341	341	339	263	509	490
Fauntleroy-Southworth	337	N/A	294	N/A	448	N/A
Seattle-Southworth	N/A	363	N/A	273	N/A	445
Seattle-Southworth (via Seattle-Vashon PO)	N/A	N/A	265	N/A	N/A	N/A
Seattle-Vashon Passenger-Only	N/A	N/A	265	N/A	N/A	N/A
Seattle-Bremerton	342	363	566	354	479	433
Seattle-Bainbridge Island	388	363	333	290	427	465
Edmonds-Kingston	345	363	303	288	539	458
Mukilteo-Clinton	360	360	334	297	535	484
Pt. Townsend-Keystone	435	435	712	533	578	569
Domestic (Anacortes-San Juans)	404	404	1,247	1,247	647	415
San Juan Inter-Island	350	350	482	482	684	508
Sidney, B.C. International Route Legs	433	433	987	987	371	274

Notable points related to Exhibits 7-9:

- Routes that do not have 4-hour to Daily factors:
 - The Seattle-Vashon PO route (and the Seattle-Southworth portion of it) do not have expansion factors for vehicles or in-vehicle passengers because they are passenger-only routes.
 - Seattle-Southworth does not have expansion factors in 2003 because it does not exist, in Fauntleroy-Southworth does not have expansion factors in 2030 because it will not exist under the Draft Plan.
- Vehicles expansion factors
 - The following routes have their expansion factors in both directions equalized at an average figure across the Kitsap travel shed: Seattle-Bremerton, Seattle-Bainbridge, Edmonds-Kingston, and Seattle-Southworth. This equalization helps to better model the shifts in ridership that occur as service is added to or subtracted from routes in the shed.
- Walk-Ons
 - By eliminating ghost riders through the method described above (tying off-peak walk-on growth to vehicle growth), walk-on expansion factors in both directions are usually lowered.
 - On the San Juan Islands routes, walk-on expansion factors are held steady at 2003 levels, as it is assumed that daily trends in walk-on ridership will apply to annual ridership as well.
- In-Vehicle Passengers
 - By eliminating ghost riders through the method described above (tying off-peak in-vehicle passenger growth to vehicle growth by holding average vehicle occupancy steady), in-vehicle passenger expansion factors in both directions are usually lowered, under the assumption that the relationship between an average weekday in May and the rest of the year will change. In

APPENDIX C: RIDERSHIP METHODOLOGY

some cases, however, commute-period vehicles are expected to grow at a faster rate than commute-period in-vehicle passengers (causing average vehicle occupancy to decrease). In these cases, off-peak in-vehicle passenger growth is still tied to 2003 average vehicle occupancy, so in-vehicle passenger expansion factors either stay the same or increase.

PROJECTING RIDERSHIP UNDER A MAXIMUM 80% FAREBOX RECOVERY RATE

In order to maintain a maximum farebox recovery rate of 80%, WSF would have to hold fares flat in many years. WSF's model outputs, however, rely on assumptions of increasing fares. Because ridership responds in part to fare levels, ridership will be higher in a given year if fares are lower. In order to estimate how much of a projected increase in ridership to expect, an analysis of fare elasticity is used. This analysis shows that for every 10% decrease in fares, ridership will increase approximately 1.4%.

